

PUBLISHED BY THE ENGINEERS' COUNCIL IN COOPERATION WITH THE ENGINEER ALUMNI ASSOCIATION



Create computers that capture the mysteries of common sense.

The brain does it naturally. It wonders. It thinks with spontaneity—advantages we haven't been able to give computers. We've made them "smart," able to make sophisticated calculations at very fast speeds. But we have yet to get them to act with insight, instinct, and intuition.

But what if we could devise ways to probe into the inner nature of human thought? So computers could follow the same rationale and reach the same conclusions a person would.

What if we could actually design computers to capture the mysteries of common sense?

At GE, we've already begun to implement advances in knowledge engineering. We are codifying the knowledge, intuition and experience of expert engineers and technicians into computer algorithms for diagnostic troubleshooting. At present, we are applying this breakthrough to diesel electric locomotive systems to reduce the number of engine teardowns for factory repair as well as adapting this technology to affect savings in other areas of manufacturing.

We are also looking at parallel processing, a method that divides problems into parts and attacks them simultaneously, rather than sequentially, the way

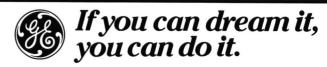
the human brain might.

While extending technology and application of computer systems is important, the real excitement and the challenge of knowledge engineering is its conception. At the heart of all expert systems are master engineers and technicians, preserving their knowledge and experience, questioning their logic and dissecting their dreams. As one young employee said, "At GE, we're not just shaping machines and technology. We're shaping opportunity."

Thinking about the possibilities is the first step to making things happen. And it all starts with an eagerness to dream, a willingness to dare and the determination to make visions,

reality.

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Aaron Chilbert
Advertising
Houra Rais
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FROM THE EDITOR IN CHIEF



The New MECHELECIV

Last year the Engineers' Council revived publication of the MECHELECIV after over a decade since it stopped appearing in 1971. The two issues published last year were well received. Having overcome the usual initial setup problems, we devoted our attention towards further improving the overall quality of MECHELECIV and expanding its readership. As a result, we are pleased to inform you that starting with this issue, MECHELECIV has a new format and is being published in cooperation with the Engineer Alumni Association (EAA). With this arrangement, MECHELECIV now has a circulation of 10,000.

Engineer alumni will receive MECHELECIV in place of the EAA Newsletter. In order to ensure regular distribution of MECHELECIV to the alumni, we hope the alumni will make contributions to MECHELECIV. This will help the Engineer Alumni Association pay the subscriptions for the alumni community and provide this important service to its members.

We hope that the faculty and administration will also use MECHELECIV as a forum of communication and exchange of ideas and help us further our efforts to make MECHELECIV into an exemplary magazine of service to the Engineering School. We hope too, that our readership will use this forum to convey their thoughts and opinions to the Engineering School community at large.

Abd-Elfattah M. Abd-Alla Fellowship

The Engineering School community mourns the untimely loss of one of its prominent and distinguished members, Professor Abd-Elfattah M. Abd-Alla. For many years Professor Abd-Alla contributed his talents and efforts to the Department of EE/CS and helped develop the Computer Science program.

Professor Abd-Alla received an opportunity this past spring, in his new role as the chairman of the EE/CS Department, to take a leadership role in implementing many of his ideas in his mission to develop and transform the Department of EE/CS to live up to the challenge of Electrical Engineering and Computer Science education in the 80's and beyond.

Professor Abd-Alla's appointment as the chairman of the EE/CS Department was also symbolic of the Engineering School's focus on academic excellence in its centennial year. Unfortunately, that was not to be. The Engineering School would have been privileged to have the benefit of Professor Abd-Alla's leadership, commitment and talent at this important juncture in the School's history.

Professor Abd-Alla symbolized the international flavor of education at the George Washington University. He contributed to the development of academic links with developing nations through his efforts to develop such ties between the Engineering School and his native country, Egypt.

It is only befitting that as part of the Engineering School's tribute to him, we set up a fellowship in his name that will help sustain what he had worked towards. Even though at least 40% of the School's enrollment is comprised of international students, there are very few opportunities for financial support for distinguished international students, especially in the undergraduate program. Dean Liebowitz has also expressed his commitment and desire to honor the memory of Professor Abd-Alla.

I urge the Department of EE/CS and the Dean to set up a "Abd-Elfattah M. Abd-Alla Fellowship for International Students". This Fellowship should be awarded once a year to a full-time undergraduate international student in the junior or senior year. Fellowship benefits should include complete tuition payment and a living allowance for one academic year. To be eligible for this fellowship a student must have a minimum distinguished academic record (for example a g.p.a. of at least 3.5/4.0) and a demonstrable financial need.

I hope the School will honor the memory of Professor Abd-Alla in this way with the same enthusiasm with which Professor Abd-Alla served this School.

Abid Kamran

Abid Kamran Editor in Chief

Are **Engineering Students** Subsidizing Other Schools?

I am pleased to see that you are coordinating the efforts to publish MECHELECIV. I am sure that this publication will contribute to bringing the alumni and student communities closer together and will keep them informed of interesting events at the School of Engineer-

I would like to raise an issue with the appropriate authorities of the George Washington University. An Engineering student pays more tuition than a student in Business Administration. This is understandable: among other factors, Engineering students require technical laboratories. But I do not understand why an Engineering student is charged at the Engineering School rate when he is taking a course at the Business Administration School or in any other School. It seems equally injust that a Business Administration student only pays Business Administration rates when taking courses in the Engineering School.

In short, why do two students in the same class with the same requirements pay at different rates? To me, it seems that we Engineering students are subsidizing the Business Administration students. We are being cheated, and discriminated against as well.

Please address this question and bring it to the attention of the proper authorities. I would like to see the issue dealt with in your forthcoming issue.

Thank you for your efforts in this matter.

Gyanchander Gongireddy

Responsible Reporting

This letter is in response to a Spring 1984 issue of MECHELECIV I received in the mail last week. Far more damage can be caused by erroneous or incomplete information in such a publication than would be caused by dumping a 55 gallon drum of gasoline in the library and striking a match. Yet setting fire to the library would bring a prison sentence, while destructive editorial practices harm only their victims. There are two suggestions I would like to make regarding MECHELECIV, concerning 1) its use to inform students of the way things are out in the real, non-academic world and 2) the need to correct the superficial and petty treatment of cheating given in the article titled "The Dark Side of GW's Engineering Education" - another article with much greater depth and accuracy would be appropriate for your next issue. 1. Real World Issues: Today, in 1984, it is a fact of life that students with a masters degree can expect to earn some 10% more than those with only a bachelors degree, throughout their careers. If they choose to pick a specialty other than one appropriate to their business, they may find that their masters degree is a disqualifier for jobs rather than a qualifier. At present specialties other than computer science or engineering administration are dangerous to your career. Although professors will not like this statement, it is a hard fact that

a doctorate is going to leave you over-qualified for most engineering jobs and is not a good idea there is such a thing as too much education. These points cannot be over-emphasized and I would suggest including them in every issue of MECHELECIV.

2. Cheating: The article "The Dark Side of GW's Engineering Education" was one sided, covering only the students' side of the issue, and is misleading in that it does not place petty forms of cheating in proper perspective with the subject of criminality in general. There should have been at least one introductory paragraph noting that petty forms of cheating are a part of a much larger problem of everexpanding criminality in the United States.

The other side of the coin is cheating by professors. Professors and student-teachers know whose work they are grading and many feel free to adjust grades automatically by ± 1 point depending upon the student, i.e. a B student might become an A student or a C student at the whim or fancy of the professor. There are also professors that take pride in producing a perfectly random set of grades among their students. And there are the ones that teach nothing, but have a great time grading students. As a starting point, the misgrading of exams and reports should be grounds for immediate dismissal of a professor or a student-teacher.

I strongly encourage responsible management of MECHELECIV, and your concern is appreciated.

John Holms.

LETTERS TO THE EDITOR POLICY: The opinions LETTERS TO THE EDITOR POLICY: The opinions set forth in the "Letters to the Editor" page of this magazine are not necessarily the opinions of the staff of the MECHELECIV. This page is set aside each issue for use by students, alumni, faculty and staff of the School of Engineering and Applied Science. MECHELECIV will also accept letters from other sources if the letters concern the magazine or would be of interest to the School of Engineering community. MECHELECIV reserves deems it necessary, or if a letter appears to be unprintable in the opinion of the Editorial staff. All letters must be signed; however, pen names may be substituted if requested.

SEDS at GWU: Center Stage for Space

by Todd Hawley

This year marks the fifth and perhaps most exciting academic year in the history of one of the fastest-rising campus organizations in the world: the Students for the Exploration and Development of Space (SEDS). This year also marks the second academic year in a row that the George Washington University SEDS chapter is the group's national headquarters.

SEDS is the world's largest student space-enthusiast organization, and it is run and governed primarily by student volunteers. The group was formed in 1980 by students on the MIT and Princeton University campuses, and it has expanded nationally and internationally in the past few years to include many of the most prestigious campuses in the world — including GWU. Since the space age began in 1957, there

has been greater and greater interest in the world's space activities on college campuses. Students interested in becoming astronauts, and also those with technical backgrounds and non-technical interests related to outer space, have become "fans" of the space program, and have often found less than satisfying the amount of information and involvement available to them on their campuses. SEDS was created by and for such students.

Scientist and science fiction author Arthur C. Clarke, who spoke at the GWU campus in April of 1984 under the sponsorship of GWU SEDS, believes that SEDS will create an environment of "informed enthusiasm" on college campuses that will be important in the future space activities of the world. Astronomer and author Carl Sagan of Cornell University (also a SEDS campus), concurs, suggesting that "the opinions of students...will to a great extent determine the direction of (the space) program."

SEDS was launched nationally and internationally through a letter printed in the Forum section of OMNI magazine in 1980, and a follow-up letter in 1981. When the few space enthusiasts who had started the organization began receiving inquiries about the group from hundreds of students from all over the world, it became clear that an international group had been born. Slowly but surely, groups of students on campuses began to form under the name of SEDS to hold meetings meant to inform their membership about the space program and space careers, to take trips to NASA installations, shuttle launches and landings, and to stage major presentations of regional and national interest on space-related issues.

Space interest on the GWU campus did not begin with SEDS, but the ever-increasing role that this campus has played in the college space movement has made it the premier college SEDS chapter in the world today. The first GW space interest group was founded in April 1981, soon after the first launch of the US space shuttle. GWU sophomore Todd Hawley had viewed the launch from the

Kennedy Space Center along with a group of 14 students from a University of Maryland (College Park) campus space group called the Maryland Alliance for Space Colonization (MASC), and decided to start a group at GWU.

By September of 1981, GWU's space group had formally become a part of the campus bureaucracy, and was called the Society for the Promotion of Habitable, Earth-Remote Environments (SPHERE). Quickly GW SPHERE took advantage of its Washington, D.C. location and held several meetings with prominent leaders in the space community, which included a well-attended talk by the attaché on Science and Technology from the Soviet embassy.

The spring of 1982 was extremely active for GW SPHERE. In January of 1982, GW became the seventh chapter of SEDS, and GW SPHERE President Todd Hawley became the SEDS National Vice Chairman for Government Relations. The first campus "Space Lecture Series" began that spring and hosted a speaker every week for twelve weeks. Leading speakers on space law, space medicine, space industrialization and commercialization

Because of its growing role in the national activities of SEDS, GW was chosen to be the site of the first-ever Founder's Conference of

to speak at GW that semester.

were among the dozen who came





by Daniel L. Briller

Lasers have recently re-emerged into the public spotlight following President Reagan's call for research into "Star Wars" type antimissile orbiting stations. In just 25 years, they have progressed from crude optical experiments to devices of wide-ranging applicability. One finds them occupying vitally important roles in such areas as fiber optics, holography, fluid flow measurement, retinal surgery, and nuclear fusion research. Within the last decade, manufacturers have begun to discover lasers can provide increased efficiency, costeffectiveness, and quality of workmanship for many established processes, among them welding, cutting, drilling, and the heat-treatment of metals. While certain obstacles still remain, it appears quite

vices use either ruby, neodymiumdoped glass or Nd:YAG (Neodymium: doped Yttrium Aluminum Garnett) crystals as the lasing medium. Ruby and glass lasers are operated in the pulsed mode, which means their energy is applied to the workpiece in quick bursts. Nd:YAG lasers are operated either in this fashion or in the continuous-wave mode, i.e. in a steady beam of light. All of the above have wavelengths of about 1 micron, making them ideal for working with most metals. Gaseous lasers, on the other hand, are fueled by argon or carbon dioxide and operate exclusively in the continuous-wave mode. A typical CO₂ laser circulates nitrogen and helium throughout the lasing medium; the nitrogen provides additional excitation, while the helium acts as a coolant.

An important distinction is also made between "light" and "heavy" lasers. "Light" lasers may be CO₂ or Nd:YAG and generate power on

THE LASER IN INDUSTRY: NOW AND TOMORROW

conceivable that lasers will revolutionize factory production in the very near future.

The laser is a device capable of generating a highly coherent, intense beam of light. Its mechanism operates at the quantum-atomic level. An external energy source for example, a bank of high voltage capacitors — boosts atoms within the lasing material from their "ground" or lowest state into higher, "excited" states. These atoms spontaneously decay back down to the ground state, and, in doing so, emit photons — particles of monochromatic light. In addition, they proceed to stimulate other atoms within the medium, a phenomenon not dissimilar to a nuclear chain reaction. Parallel mirrors reflect these photons back and forth, giving rise to an intense, focused beam of light.

Generally, two types of lasers are used in manufacturing: solidstate and gaseous. Solid-state dethe order of 10 to 100 watts. They are most often used for cutting and drilling ruby crystals for watches, machining integrated circuit chips, and small-scale welding, drilling, and cutting of metals. "Heavy" lasers exhibit power ranges of 1 to 20 kilowatts and are almost always continuous-wave CO₂. Their applications include pipeline and autoassembly welding and the heattreating of diesel engine cylinder walls.

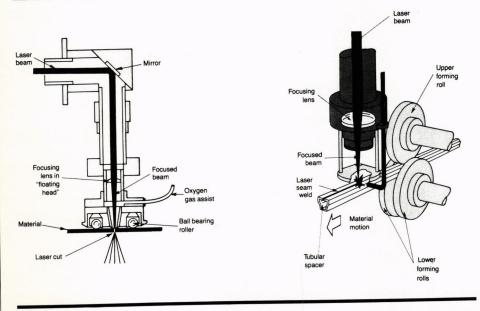
Conventional manufacturing processes, which include welding, drilling, cutting, surface hardening, and alloying, all characteristically depend on the application of intense heat to the workpiece. Traditional heat sources have included flames, torches, electric arcs and plasma jets. The laser offers some very noticeable advantages over these. First, since it heats only a thin surface layer (approximately 10 nanometers thick), the heat flux and con-

sequently the energy efficiency are elevated considerably. In fact, laser systems may be 10 to 100 times more energy-efficient than conventional ones. Second, its focused beam concentrates heat on the desired work area. Conventional sources often heat more than the necessary surface area, potentially resulting in cracks and stresses within the part. Lasers are maneuverable and can reach hitherto inaccessible areas through the use of mirrors. They can consistently repeat a job with the same high level of accuracy, and are clean, fast and easily compatible with automated and numerically controlled systems.

Laser drilling is performed by heating the workpiece in short

the amount of energy required increases greatly with the size of the hole. Another major difficulty to be overcome is that of blanketing, a phenomenon by which ionized vapors in the vicinity of the beam absorb and/or scatter the incoming light photons.

Cutting is accomplished in a manner analogous to drilling. Here, too, the laser does away with mechanical wear and the necessity of replacing expensive diamond heads. Not only metals, but also wood, plastics, ceramics, and fabrics have all been successfully cut by lasers. In fact, several British and American textile manufacturers are using computer-controlled lasers to cut the complicated patterns for men's suits.



A laser cutter slides on rollers over a sheet of material. Note the mirror which focuses the beam on its target and the oxygen gas assist for blasting away debris. Courtesy of Mechanical Engineering Magazine.

Welding of regular or irregular parts is readily accomplished with a laser. Here, two ends of a spacer are joined along a narrow seam, a job requiring great precision and steadiness. Courtesy of Mechanical Engineering Magazine.

bursts, thus vaporizing the surface material. A jet of oxygen or nitrogen gas then blasts away any residue material, preventing it from cooling and resolidifying inside the hole. Lasers can effectively drill through much harder materials, and with greater precision, than mechanical drills. Also, they completely eliminate the problems of mechanical wear and possible breakage of the drilling element. Lasers are still not practical for drilling large holes, however, as

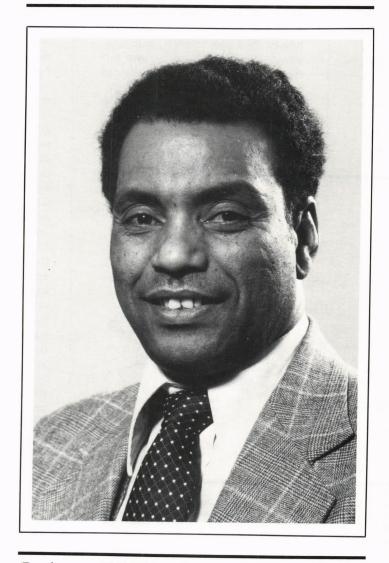
Two basic welding methods are used in manufacturing: conduction and deep-penetration. In conduction welding, the heat source is applied to the surface of the pieces only, and is therefore most feasible for joining thin plates or sheets. Lasers are more applicable to deep-penetration welding, or to those welds having a high depthto-width ratio. By a mechanism known as the keyhole effect, vaporized and molten metal rises to the surface and solidifies to form

surface beads. These beads enhance the mechanical properties of the weld, such as hardness, fracture toughness, and tensile and impact strengths. Temperatures of up to 26,000° F initiate another process called fusion-zone purification by which inclusions (bits of foreign matter within the metal) are vaporized, leaving behind a purer, stronger weld. Conventional electron-beam and arc welding often produce welds which are weaker than the original base metal. Again, the laser is cleaner; neither welding rods, fluxes, nor highly skilled craftspersons are required.

Surface hardening techniques allow the manufacturer to produce parts more resistant to corrosion and wear. Principally, it is done by cladding (coating) the base metal with a more wear-resistant alloy. General Motors, for one, has had excellent success in incorporating lasers for this purpose. They utilize 1 and 5 kilowatt lasers to harden the cast-iron inner walls of diesel engine cylinders and power-steering gear housings. Taking this one step further, United Technologies has developed what may be the manufacturing process of the future. This unique method, known as Lazerglaze, uses the laser to actually construct a part, for example, a turbine disk. Wire is wound around a mandrel (cylindrical spindle), and the heat of the beam shapes it and fuses it into place.

What the future holds for lasers in industry, one can only speculate. As these techniques are still in their infancy, many problems must still be solved. One area which cannot be overlooked is that of worker safety. Laser radiation can seriously damage exposed human tissues, in particular, the delicate ones in the retina. Furthermore, it will be some time before factories and assembly plants are able to integrate speedy, versatile, and productive lasers with the more outmoded technology already present. Nevertheless, the advantages they offer make them practically indispensable to the factory of the future. Some day soon, nearly every part of the cars we drive, down to the pipelines which bring gasoline for them, will have passed under one of these remarkable beams.

In Memorium



Professor Abd-Elfattah Mohammed Abd-Alla
Chairman,
Department of Electrical Engineering
and Computer Science
1937-1984
Mourned and Remembered by his Family,
Friends, Colleagues and Students

Dr. Abd-Elfattah M. Abd-Alla, Professor of Engineering and Applied Science and Chairman of the Department of Electrical Engineering and Computer Science, died July 22, 1984 in Cairo, Egypt. He was involved in an auto accident while on a two-week visit with his family. He was 46 years old.

Professor Abd-Alla's death was deeply felt by his friends, colleagues, and his students. The School of Engineering and the Department of Electrical Engineering & Computer Science were shocked upon receiving the tragic news of the accident. At first, no one believed such a thing could happen, but upon reconfirming the report, the loss and melancholy permeated the Department.

Dean Harold Liebowitz, who was out of town at the time of the accident, expressed his feelings in a letter sent to the Acting Chairman of the Department of Electrical **Engineering and Computer** Science, Professor Walter Kahn. He wrote "I am terribly saddened by the loss of Professor Abd-Alla. He will be greatly missed by me. We spoke to each other prior to his departure for Cairo. Both of us were looking forward to working closely together in his new position as Chairman. His unexpected accident shocked all of us. Although there is nothing that can be done to bring him back, I will do whatever is possible to honor him. I look forward to initiating a Memorial Fund in his name. Kindly inform me of any wishes you or our colleagues may have in assuring a deserving memorium."

The Department held a memorial service for Dr. Abd-Alla on July 26, 1984. At that service, Associate Dean James Feir, Professors Walter Kahn and Arnold Meltzer, and doctoral student Yousry El-Gamal expressed their grief and the grief

of all those who knew Professor Abd-Alla. The following are some excerpts from the presentations at the service.

Dean Feir, speaking for the School on behalf of Dean Liebowitz, said the following words of tribute to Abd-Elfattah: "There is always sadness in the passing of someone whose life has spanned the period from child-hood to old age, but the bereavement that attends the sudden and catastrophic passing of a man in the prime of his life possesses its own very special forms of distress and unhappiness.

And so it is the latter situation which brings us together today to pay tribute to Abd-Elfattah Abd-Alla, our colleague and friend, who would have reached the age of 47 years this September.

He was a distinguished scholar who, after receiving Bachelors and Masters Degrees at Ain Shams University and Alexandria University in Egypt, came to this country to undertake further graduate study including a doctorate in Computer Science from the University of Maryland.

He joined the faculty of the School of Engineering and Applied Science in the 1969-1970 academic year and was Professor of Engineering and Applied Science at the time of his death. It is also testimony to the esteem and respect accorded him by his colleagues that he was elected Chairman of The Department of Electrical Engineering and Computer Science and had just assumed that position several short weeks ago.

He was the author of an extensive list of publications relating to computer hardware and microprocessors including an important and popular two volume textbook series "Principles of Digital Computer Design" co-authored with

Professor A.C. Meltzer.

In addition to his distinguished professional career as an engineer and a teacher, I will remember Abd-Elfattah Abd-Alla as a quietly energetic human being, unfailingly polite and cheerful with a good sense of humor, and with a deep and compassionate interest in the affairs of students and faculty alike. Moreover, his efforts in creating stronger cultural and scientific ties between the United States and his native Egypt were of great service to the School and its students, and were, in addition, attractively symbolic of his proud cultural heritage.

To his wife, Dr. Wagida Abd-Alla, and his children, Sherif and Noha, to his sister, Mrs. Mohammed Hassan, and his brothers, Ibrahim and Hanafy, I say that we are all thankful for the privilege of knowing him. He will always be remembered and we will always miss him."

Professor Walter Kahn knew Professor Abd-Alla as a colleague for more than 15 years. He had been appointed as Acting Chairman of the Department by Professor Abd-Alla while Abd-Alla was on vacation. Professor Kahn, speaking on behalf of all the faculty of the Department, expressed these thoughts:

"I have always valued Dr. Abd-Alla above all for his great and innate courtesy, the courtesy with which he dealt with all of us in the Department, colleagues and students. I would like to remember him as an appreciative guest and a gracious host. He had most recently invited all of us, his colleagues in the Department, to their new home which he and his lovely wife Wagida had created in Virginia. Needless to say, everything that could be done to make us feel welcome and to give us the sense of being his honored guests was done. It is the memory of that still

recent, very pleasant evening in his company that comes to my mind when I think of him.

Abd-Elfattah was struck down in the very prime of his life. At the age of 46 he could look back on a life of accomplishment in two countries, Egypt and the United States. He, as you know, was the overwhelming choice of his colleagues for the position of Chairman of our Department. At this time when we are all engaged in an enterprise to raise our Department to a new level of excellence and to obtain a new level of recognition, Abd-Alla was the man in whom we placed our confidence. He, in turn, brought to his new position of honor and prominence fresh vigor, genuine enthusiasm, and boundless optimism. What is more, he was clearly able to convey these qualities, on behalf of our Department, to our partners in the University administration. He left us in a cheerful frame of mind for this reunion with his close family, and was looking forward to his return and to resuming his work in our behalf. We are all immeasurably poorer for his loss.

If we would erect a fitting memorial to his memory, it would be to take up where he left off."

Professor Arnold Meltzer was a close friend of Professor Abd-Alla as well as a colleague of 15 years. They had authored a two volume text on digital computer design and had cooperated on many projects and seminars. Professor Meltzer expressed these thoughts at the service.

"I knew Professor Abd-Alla for 15 years. We had worked very closely together as co-authors of a text. We had spent many hours together, both day and night, writing and editing the text. We became one person during that period as we decided what and how to write the book. Abd-Alla was the optimistic half of our association—always smiling, always cheerful. I was the grouch. Everyone will always remember his smiling face.

Professor Abd-Alla loved his family and his children. He loved all children. I remember how, before he was married, he would come to my home and play with my children. My daughter was in love with him and was disappointed when he married — she was eight years old at the time, intending to marry him herself. My family will miss him.

Professor Abd-Alla was a religious man who never cursed. In the fifteen years that I knew him, I never once heard him utter profanity. He was a good Moslem and was an active member of this community in Washington. He will be missed by that community who will mourn for him.

Abd-Alla was an excellent teacher and all of his students respected him and were inspired by him in their work. He had a comprehensive knowledge of computer hardware and especially of microcomputer systems. He had consulted for many years in the design of systems which were controlled by microprocessors. The courses he taught in computer design, digital logic design, and microcomputer design were always well attended and he received good reviews from his students. He will be missed as a teacher and researcher.

Professor Abd-Alla had just assumed the Chairmanship of our Department and had expressed many fine ideas to improve the Department and make it better than it is currently. We, his colleagues, will honor his memory and bring to fruition his ideas so that our Department will be a memorial to him. All of us miss him."

Mr. Yousry El-Gamal, a doctoral student, who was doing his research under Professor Abd-Alla expressed these thoughts on behalf of the students:

"We were all afflicted with the calamity of the tragic loss of Prof. Abd-Elfattah Abd-Alla, but for his students and advisees, and in particular, the Egyptian student community - which I do represent the affliction was far beyond the expressing power of the words we know. The feeling was a shock more than agony...and a stun rather than pain. We even started to repeat the same question again and again "Is this true?" to everyone we knew, hoping against hope that someone, somewhere, would not confirm the sad news.

For us, Prof. Abd-Alla represented a lot more than a professor, even more than just an Egyptian professor...For us, he was a source of inspiration, ... A light of stimulation,...And a major factor of motivation. His vibrant personality gave us the confidence that we did have a brother within the faculty members, always willing to understand. And at times of hardship, when things refused to go the way we wanted, he was always there, enlightening our way, stimulating our efforts, and upgrading our confidence. The smile he used to wear when meeting any of us was such a big relief with a soothing effect against any academic or personal difficulties we might have had. For his students, he always had all the time in the world, whether they came for an academic purpose, or even just to chat. I recall a time when I told him that I wonder if such a professor would give me such a grade. He replied: "Nobody here would give you anything, you earn what you get, go ahead, work hard and have faith". His dedication as a teacher and advisor inspired us

as students for more devotion and hard work.

His strong ties with his homeland, and the pride he had in his cultural heritage contributed to the creation of the graduate studies agreement between this University and the Military Technical College of Cairo, Egypt, and it was his intention to foster more collaboration agreements with other Military and Civilian Institutions in Egypt during this last unfortunate visit. When I called the Director General of our Academy, who had met with Prof. Abd-Alla for the

first time last spring, to tell him the sad news, he expreessed his tremendous feeling of loss. He was looking forward to meet with Prof. Abd-Alla in Alexandria to foster the continuing education plan for the Academy, in collaboration with George Washington University. He even considered sending his own son to pursue his studies in the computer science field, simply because Prof. Abd-Alla was here.

To your soul Prof. Abd-Alla let me say that the lights you shed in our hearts, will never be dimmed by your sudden departure. This is the time of inspiration but never desperation. We are determined more than ever to continue all the way you engineered to achieve what we came here for, with the honor and dignity you stimulated in our souls. You may find us a little grimace...but more determined, a bit concerned...but highly motivated, perhaps less cheerful...but never less confident. You will be greatly missed and long remembered, and to our children and the new generations, you will always be mentioned."



Professor Abd-Alla and his wife, Dr. Wagida Abd-Alla

FROM THE EAA

From the EAA President

Welcome to the first joint Engineers' Council/Engineer Alumni Association issue of MECHELECIV. The Engineer Alumni Association (EAA) is pleased to be working with the Engineers' Council on the publication of this fine magazine. We believe that this joint venture will serve as a means to provide better communication and understanding among SEAS students, alumni, and faculty. We encourage you to contribute to our effort by providing us with feedback on this issue and by submitting articles or advertisements for inclusion in future issues.

The EAA is planning a number of activities this year. First is the fall picnic, sponsored by the EAA, the Engineers' Council, and Omega Rho. We expect to have a "back to school" event and an embassy function, and as usual, we will continue to work this spring with SEAS on the Dean's Reception and with the Alumni Office on Reunion Weekend. One of our major aims for the year is to raise sufficient funds to award an EAA scholarship for the academic year 1986-1987. We will keep you informed on our activities through the MECHELECIV and special mailings.

Mary O. Jones, President, EAA

Engineer Alumni Association Elects New Officers

The Engineer Alumni Association (EAA) Board members elected new officers for the 1984-1985 year during a dinner meeting on June 18, 1984. The June meeting of the Board also provides a forum for summing up the highlights of the EAA's completed year and establishing the events and a program emphasis for the new year.

This year the following officers were elected:

President: Mary O. Jones. This appointment has historical significance in that Mrs. Jones is the first woman to be elected to this position. She has been a long standing member of the EAA Board and has unselfishly dedicated many hours of her time to committee and officer duties. She received a Masters degree in Computer Science from the School of Engineering and works with the U.S. Geological Survey in Reston, Virginia, as a Systems Analyst. Mrs. Jones is married to Dr. Douglas Jones, a past president of EAA and a Professor of Mechanical Engineering at

Vice President: Dudley J. Schwartz. Mr. Schwartz has been actively involved in EAA programs and affairs for many years and is extremely interested and responsive to alumni needs. He received his Masters degree in Operations Research in 1973 from S.E.A.S. and currently works for ANSER in Arlington, Virginia. Mr. Schwartz is a strong supporter of EAA programs and events and in the recent past has held the position of Treasurer. He has been in Washington, D.C. for seventeen years.

Secretary: Robert Dickey, Jr. Mr. Dickey was the Treasurer last year and his efficient and conscientious work was recognized by the Board. He received his Masters in Electri-

cal Engineering in 1979 from S.E.A.S. and works with the PEPCO in the department of Design of Electrical Services Connections. He has been with PEPCO for twenty years and is a native Washingtonian.

Treasurer: Nahid Khozeimeh. If you have attended the successful Russian, Finnish, Indonesian, Kuwaiti and Chinese Embassy parties, then you know Mrs. Khozeimeh. She received her Masters in Architecture Engineering from Teheran University and was finishing her doctoral program in City Planning when she left Iran. She continued her education and received her Masters in Transportation Engineering form S.E.A.S. She works for the George Washington University as a Special Assistant to Dean Liebowitz for International Programs. Both Nahid and her husband Issa Khozeimeh have many years of service to the EAA to their credit.

Engineer Alumni Association Board of Directors 1984-85

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Dudley J. Schwartz

Secretary: Robert Dickey, Jr.

Treasurer: Nahid Khozeimeh

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Student Representative: Ayman Jumean

Alumni Office Representative: Ronald W. Howard

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Term Expires June 1986 Robert Dickey Jacquelyn Eisenberg David Johnson An Thanh Le Cleveland Watkins

Term Expires June 1987 Frank Atwood Nahid Khozeimeh James Sinsabaugh Dudley Schwartz Edwin Stengard

Past Presidents of EAA
Permanent Board Membership
Pastor Farinas
Douglas Jones
Issa Khozeimeh
Eric Mendelsohn
John Wolfgang

Events for 1984-1985

On July 18, 1984, Mary Jones held the first Executive Committee meeting of the new year, to appoint committee chairs and members and outline a program for the coming year.

The 1984-1985 year should be an exciting one. The EAA Board plans to improve on its traditional events, such as the Annual Engineering School Picnic at Carderock (see page 14), Engineers' Week, Dean's Reception where the EAA Service Award and Achievement Award are presented, Alumni Week and an Embassy Visit.

As a means of forging closer cooperation and understanding between the alumni and students, the EAA and the Engineers' Council will cooperate in publishing MECHELECIV. Also, through generous donations from S.E.A.S. alumni, we are planning to award at least one scholarship during this year.

SEDS..

Continued from page 5

hundred and twenty. There were trips to see the fourth and fifth shuttle launches and EPCOT Center in Florida. GWU SEDS was asked to again host the SEDS International Conference at GWU in July, 1983. About 70 students attended that conference, and there, through contacts made at UNIS-PACE '82 with the famed scientist and science fiction author, the first Arthur C. Clarke Award for Space Education was given to Dr. David C. Webb at the Second Annual SEDS Conference at GWU.

GWU took over as the National Headquarters of SEDS in September of 1983, after it had been at MIT for three years, with two national officers on its campus: Todd Hawley as National Chairman, and Mary Ann Grams as Vice Chairman for Public Relations. The group at GWU also formally changed its name from SPHERE to SEDS, and SEDS National became affiliated with the Washingtonbased American Astronautical Society. Soon afterwards, GWU SEDS hosted the first SEDS Space Militarization Debate, which included the likes of experts Gen. Daniel O. Graham (Ret.), and Dr. David C. Webb, who debated the issue of weapons in space before an audience of over two hundred in the Marvin Center. GW SEDS also made it to Florida to see the seventh and eighth shuttle launches. Despite the added responsibilities of being SEDS National Headquarters, GWU again hosted many activities throughout the year, highlighted by a visit to the campus by Arthur C. Clarke. Clarke's engagement was his only public speaking appearance in the U.S., and drew a crowd of over 600 to Lisner Auditorium. His talk included discussions of 2001: A Space Oddyssey and 2010, as well as the newly established Arthur Clarke Center for Modern Technologies in Sri Lanka, Clarke's country of residence.

The Third Annual Conference of

the Students for the Exploration and Development of Space was again held at GWU, with attendance at about 150. As usual, the conference coincided with the Apollo landing anniversary, and was further celebrated with a Banquet Keynote Address by the Administrator of NASA, James Beggs, on the evening of the fifteenth anniversary itself. The second Arthur Clarke Award for Space Education was given to Carl Sagan, who accepted it with a videotaped message, and the first SEDS Space Scholarships were given to several students, including Christine Spector, a GWU Ph.D. candidate.

The year ahead looks quite exciting for SEDS at GWU, and there is certain to be a trip or two to Florida, with possibly seven shuttle launches during this academic year. (One launch will include a GW Engineering School graduate as a passenger - astronaut Frederick Gregory - who is scheduled to fly in January of 1985.) GWU SEDS will also host the first Space University Symposium on September 24, 1984, in the GWU Marvin Center Ballroom. SEDS National will be coordinating two Space Career Conventions in Tucson and Boston in March and April, respectively. Naturally, GWU SEDS will host the Fourth Annual SEDS International conference, the weekend of July 19-21, 1985. Other activities are in the offing, and to get involved from the outset it is important to attend the group's first meeting in early September.

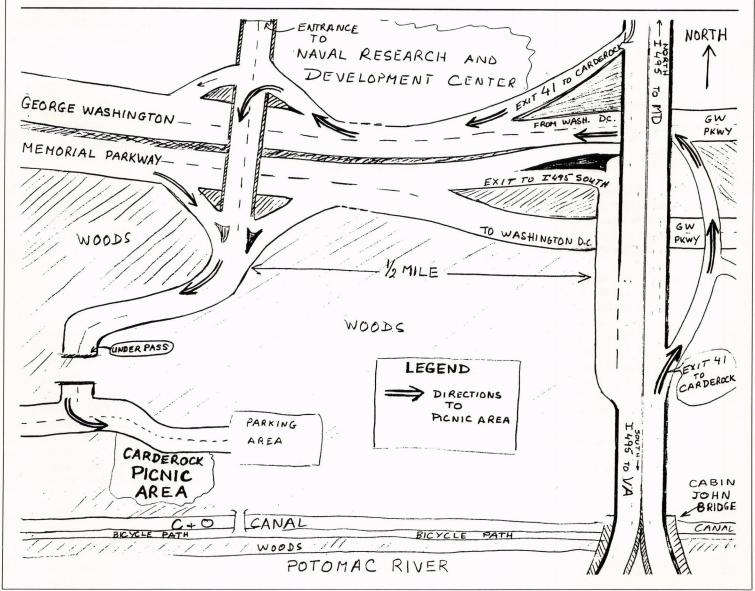
As this brief history demonstrates, GWU is an exciting place to study for those interested in the human adventure in space – a movement which is becoming at once more exciting and important. As its many members here at GWU will tell you, SEDS is a terrific way for students to become more involved in that movement. GWU SEDS invites all members of the GWU community to come join them at the center stage for space!

For more information on SEDS, visit the SEDS Headquarters in Marvin Center room 423, or call 676-7102.

ANNUAL ENGINEERING SCHOOL PICNIC SEPTEMBER 29TH

The School of Engineering and Applied Science picnic will be held on Saturday, September 29th from noon till dusk at the National Park's picnic area at Carderock. Maryland on the Potomac River. This annual event is jointly sponsored by the Engineers' Council and the Engineer Alumni Association. The event last year was the best ever with over 150 attending with family members. The event offers an opportunity for alumni, students and faculty to get together for a mixer of socializing with good friends, games of competition, food and drinks. In addition to hot dogs, hamburgers, beer and soft drinks there will be games including softball, soccer, wet balloon throwing, volleyball and other contests for all ages.

Come on out to the picnic and make this the best event yet. Plan to attend by calling the alumni house at (202) 676-6435 or the Engineers' Council at 676-6744 before September 25th. The Engineers' Council is trying to make arrangements for free transportation (to and from picnic) from Davis-Hodgkins House. Please call 676-6744 to reserve a place for yourself. No charge for the picnic. Directions are to find David W. Taylor Naval Ship Research and Development Center on the George Washington Memorial Parkway and 1/4 mile outside the Capital Beltway, I-495 in Carderock, Maryland. If you need better directions, call the Park Police at (202) 492-6293 or consult the map below:



SCIENCE SCOPE

Artificial intelligence, the programming that lets computers "think" almost like humans, is the focus of a new advanced technology center at Hughes Aircraft Company. The facility brings research and development efforts under one roof. Scientists and engineers will work closely with universities throughout the country to develop software and equipment. Finished systems will be able to make far more complex decisions than the simple "yes" or "no" decisions that traditional software programs require. Projects will include self-controlled systems and image understanding - both of which can be used in such applications as geological surveys from space, manufacturing technology, and defense.

Satellite Business Systems will add two space craft to its constellation of four to provide U.S. businesses with voice, facsimile, teleconference, and high-speed data services. Like their predecessors, SBS-5 and SBS-6 will operate in the K'band frequency range. In addition to the standard 10 channels of 43'MHz each found on earlier versions, the new spacecraft will carry four transponders with bandwidths of 110'MHz each. This feature nearly doubles the telecommunications capacity of SBS-1. The new satellites will allow SBS to serve Alaska and Hawaii for the first time. They are designed with a 10-year operational life instead of the current seven. The new spacecraft are based on the Hughes HS'376 model. This versatile drum-shaped satellite, with 30 versions sold, is the world's most popular commercial communications satellite.

Development times for semicustom very large-scale integrated (VLSI) circuits have been cut from greater than one year to 20 weeks at an ultramodern computer-aided training and design center at the Hughes facility in Newport Beach, California. Utilizing advanced design automation software, a comprehensive library of predesigned logic functions (called Macros), and preprocessed wafers, the new facility is helping engineers design chips with 2,000 to 8,000 gates and with as many as 180 pins. New 3-micron dual-layer metal HCMOS processes are applied to both standard cell products and state-of-the-art gate arrays. Skilled design engineers and education specialists at the Newport Design Center provide training and technical support for IC designers throughout the company.

Hybrid integrated optical receivers have been developed by Hughes research scientists for transmitting microwave-modulated optical signals over fiber-optic links. The receivers are part of an effort to find inexpensive links for such applications as phased-array antennas, satellite ground stations, radars, and communications systems. Each receiver consists of a high-speed gallium arsenide Schottky photodiode developed at Hughes and a low-noise amplifier using commercial gallium arsenide field-effect transistors. These receivers are designed to operate at a modulation frequency of 3 GHz with a 1 GHz bandwidth. Their advantages over discrete components include better sensitivity, lower noise, and the elimination of ripples in the frequency response caused by impedance mismatch between detectors and commercial amplifiers.

<u>Hughes needs graduates with degrees</u> in EE, ME, physics, computer science, and electronics technology. To find out how to become involved in any one of 1,500 high-technology projects, ranging from submicron microelectronics to advanced large-scale electronics systems, contact Corporate College Relations Office, Hughes Aircraft Company, P.O. Box 1042, Dept. C2/B178-SS, El Segundo, CA 90245. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 11205, Marina del Rey, CA 90295



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FOR YOUR INFORMATION

MECHELECIV encourages all students, alumni, faculty and staff of the School, and our other readers to contribute to or join the magazine and avail of this unique opportunity for organizational, journalistic and artistic experience, as well as receive exposure and recognition.

For more information, please call (202) 676-3998 or write to MECHELECIV.

SUBSCRIPTIONS AND CONTRIBUTIONS

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